

RD06 GPRS data protocol

1 Data communication

1. Set RD06 RTC time :

After a connection is established between the device and the server, the device sends a data message to the server. The server sends the following information to the device to change the RTC time. It is recommended that the server set the RTC time each time when the device connects to the server.

Set the RTC time Format: `@UTC,yyyy-MM-dd HH:mm:ss#`

For example: `@UTC,2021-11-24 02:56:43#`

**please note the time setting should be UTC +0 time*

C# code:

```
byte[] utcBytes = System.Text.Encoding.Default.GetBytes(string.Format("@UTC,{0}#",  
System.DateTime.UtcNow.ToString("yyyy-MM-dd HH:mm:ss")));
```

```
_NetStream.Write(utcBytes, 0, utcBytes.Length);
```

2 Data parsing

RD06 GPRS data is hex format.

The format of hex code:

Format: Start symbol(2byte) + Packet length(2byte) + Protocol type(2byte) + Hardware type(2byte) + Firmware version(4byte) + IMEI(8byte) + RTC time(6byte) + LBS data length(2byte) + LAC(2byte) + CELLID(2byte) + Extension(A) + State data length(2byte) + Alarm type(1byte) + Terminal information(1byte) + GSM signal strength(1byte) + GSM state(1byte) + Battery voltage(2byte) + Power voltage(2byte) + Extension(B) + TAG information data length (2byte) + TAG type(1byte) + Number of the TAG(1byte) + Length of per TAG(1byte) + TAG information(X byte) + Extension(C) + Extension(D) + packet index(2byte) + Check code(2byte) + Stop symbol (2byte)

Here below is a table which informs more detailed information about the protocol.

Data block	Number of bytes	Data Content	Meaning
Start symbol	2	'TZ'	Header of every packet
Packet length	2	Variable	The packet length range from the protocol type to the Check code (include the protocol type and the Check code)
Protocol type	2	'\$\$'	
Hardware type	2	04H 06H	
Firmware version	4	Variable	i.e. 01H 06H 00H 00H means Firmware version is 1.06
IMEI	8	Variable	BCD format, i.e.08H 65H 47H 30H 33H 61H 81H 36H means IMEI is 865473033618136
RCT time	6	Variable	The RTC time when packet The sequence is Year Month Day Hour Minute Second i.e. 11H 08H 1FH 04H 23H 39H means 2017/08/31/ 04: 35: 57
LBS data length	2	Variable	LBS's data length, if the value is 00H 00H, means no LBS data.
LAC	2	Variable	i.e. 27H B6H means LAC is 27B6
CELL ID	2	Variable	i.e. 11H FBH means CELL ID is 11FB
Extension	A=0		For future extending the protocol use, currently, has nothing, do not possess any byte
Status data length	2	Variable	The status data length, if this part is 00H 00H means no status data.
Alarm type	1	Variable	AAH Interval GPRS data 10H Low battery Alarm 60H Begin Charge 61H End charge
Terminal information	1	Variable	Bit7: 1-connect to power 0-not connect to power Bit6:1-This packet is the last packet of this packet index 0- This packet is not the last packet of this packet index Bit 5-0 :reserved
GSM signal strength	1	Variable	CSQ value

GSM status	1	Variable	Bit 7-6 :reserved Bit 5: 1-TCP\UDP connected 0-TCP\UDP not connected Bit4: 1-GPRS network connected 0-GPRS network not connected Bit3: 1-roaming 0-not roaming Bit2: 1-GSM network connected 0-GSM network not connected Bit1: 1-Detected SIM card 0-no SIM card Bit0: 1-GSM module is on 0-GSM module is off
Battery voltage	2	Variable	Unit:10mv, MSB first i.e. 01H A6H=422, 422*10=4.22V
Power voltage	2	Variable	Unit:10mv, MSB first i.e. 04H E1H=1234, 1249*10=12.49V
Extension	B=0		For future use, currently, this part has nothing, do not have any byte
TAG information data length	2	Variable	The length of tag data area, 00H 00H means no tag data
TAG type	1	Variable	00-TAG06/06B 03-The TAG06/06B contains the RTC
Number of the TAG	1	Variable	The number of tag in this packet
length of per TAG	1	0BH	The length of per Tag
TAG information	X	Variable	per tag data format: ID + status + battery voltage + temperature + humidity + RSSI ID(4byte): Status(1byte): bit7: Battery voltage status, 1-low Voltage, 0- Voltage normal; bit6: Temperature alert status, 1-Temperature alert, 0- Temperature normal, bit4:Whether an ACK reply is required 1-Need, 0-Neen't, bit3:Whether RTC time is included 1-Contains,

			<p>2-Doesn't contains bit5/bit2-0:reserved;</p> <p>battery voltage(2byte):Unit: 1mv, MSB first, i.e. 0EH 08H means voltage is 3.592V;</p> <p>temperature(2byte):unit:0.1°C, MSB first, bit15:tag normal or abnormal 1- abnormal 0- normal bit14:temperature positive(+) or negative(-), 0-positive, 1-negative, Bit13-0: temperature value i.e. 01H 1FH means temperature is 28.7°C, 41H 1FH means temperature is -28.7°C, 80H 00H means tag abnormal;</p> <p>Humidity(1byte):unit:%, if it is FFH means no humidity, i.e. 40H means humidity is 64%.</p> <p>RSSI(1byte):unit: -dBm i. e. 46H means RSSI is -70dBm</p> <p>Receive the TAG RTC time(6byte)(reserved): 13H 07H 1AH 04H 11H 120H Means 2019\07\26 04:17:32 Note:TAG RTC time needs to be on at the tag, otherwise it will be off by default,TAG RTC time can be receive for RD06 firmware version 2.07 and above, and set for TAG06/06b firmware version 3.0 and above</p>
Extension	C=0		For future use, currently, this part has nothing, do not have any byte
Extension	D=0		For future use, currently, this part has nothing, do not have any byte
Packet index	2	Variable	The value range of this part is between 1 and 9999
Check code	2	Variable	The range is from Protocol type to Packet index(include Protocol type and Packet index),MSB first, can see the Check code calculate function CRC16 at document RS485 modbus protocol v1.1
Stop symbol	2	0DH 0AH	

For example:

RD06 data doesn't contains TAG RTC time(default):

54 5A 00 45 24 24 04 06 01 04 00 00 08 65 47 30 33 61 81 36 11 08 1F 04 23 39 00 04 27 B6 11
FB 00 08 AA C0 13 37 01 A6 04 E1 00 19 00 02 0B 62 16 00 93 00 0D 4F 40 E4 40 3E 62 16 03
74 00 0C A1 01 13 34 46 00 D0 1F 74 0D 0A

Start symbol: 54 5A—'TZ';

Packet length: 00 45—69 bytes;

Protocol type: 24 24—'\$\$';

Hardware type: 04 06;

Firmware version: 01 04 00 00—1.04;

IMEI: 08 65 47 30 33 61 81 36—865473033618136;

RTC time: 11 08 1F 04 23 39—2017\08\31 04:35:57

LBS data length: 00 04—4 bytes;

LAC: 27 B6—27B6;

CELLID: 11 FB—11FB;

State data length: 00 08—8 bytes;

Alarm type: AA;

Terminal information: C0—connect to power, last packet

GSM signal strength: 13—19;

GSM state: 37—TCP\UDP connected;

Battery voltage: 01 A6—4.22V;

Power voltage: 04 E1—12.49V;

TAG information data length: 00 19—25 bytes;

TAG type: 00;

Number of the TAG: 02;

length of per TAG: 0B;

TAG information: 62 16 00 93 00 0D 4F 40 E4 40 3E 62 16 03 74 00 0C A1 01 13 34 46

TAG1: 62 16 00 93 00 0D 4F 40 E4 40 3E

ID:62160093

status:00

battery voltage: 0D F4—3.572V;

temperature: 40 E4— -22.8°C;

humidity: 40—64%;

RSSI: 3E— -62dBm;

TAG2: 62 16 03 74 00 0C A1 01 13 34 46

ID:62160374

status:00

battery voltage: 0C A1—3.233V;

temperature: 01 13— 27.5°C;

humidity: 34—52%;

RSSI: 46— -70dBm;

packet index: 00 D0—208;

Check code: 1F 74;
Stop symbol: 0D 0A

RD06 data contains TAG RTC time:

54 5A 00 51 24 24 04 06 02 07 00 00 08 62 05 70 44 27 62 09 13 07 1A 04 12 08 00 04 27 93 11
3C 00 08 AA C0 1A 37 01 9C 04 D9 00 25 03 02 11 62 19 03 56 18 0E 56 01 02 3C 48 13 07 1A
04 11 16 06 19 21 51 18 0E 56 00 F7 FF 4F 13 07 1A 04 11 20 00 7F 76 5B 0D 0A

Start symbol: 54 5A—‘TZ’;
Packet length: 00 51—81 bytes;
Protocol type: 24 24—‘\$\$’;
Hardware type: 04 06;
Firmware version: 02 07 00 00—2.07;
IMEI: 08 62 05 70 44 27 62 09—862057044276209;
RTC time: 13 07 1A 04 12 08—2019\07\26 04:18:08;
LBS data length: 00 04—4 bytes;
LAC: 27 93—2793;
CELLID: 11 3C—1113C;
State data length: 00 08—8 bytes;
Alarm type: AA;
Terminal information: C0—connect to power,last packet
CSQ: 1A—26
GSM state: 37—TCP\UDP connected;
Battery voltage: 01 9C—4.12V;
Power voltage: 04 D9—12.41V;
TAG information data length: 00 25—37 bytes;
TAG type: 03;
Number of the TAG: 02;
length of per TAG: 11;
TAG information: 62 19 03 56 18 0E 56 01 02 3C 48 13 07 1A 04 11 16
06 19 21 51 18 0E 56 00 F7 FF 4F 13 07 1A 04 11 20
TAG1: 62 19 03 56 18 0E 56 01 02 3C 48 13 07 1A 04 11 16
ID:62190356
status:18
battery voltage: 0E 56—3.67V;
temperature: 01 02— 25.8°C;
humidity: 3C—60%;
RSSI: 48— -72dBm;
Receive the TAG RTC time:13 07 1A 04 11 16—2019\07\26 04:17:22
TAG2: 06 19 21 51 18 0E 56 00 F7 FF 4F 13 07 1A 04 11 20
ID:06192151
status:18

battery voltage: 0E 56—3.67V;

temperature: 01 13— 24.7°C;

humidity: FF—without;;

RSSI: 4F— -79dBm;

Receive the TAG RTC time:13 07 1A 04 11 20—2019\07\26 04:17:32

packet index: 00 7F—127;

Check code: 76 5D;

Stop symbol: 0D 0A